Fact Sheet

Groundwater Sources Under the Direct Influence of Surface Water (GWI)

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(Update)

Background

The federal Surface Water Treatment Rule applies to all Group A public water systems (community and non-community) that use:

- Surface water sources.
- Groundwater sources under the direct influence of surface water (GWI).

Such sources are vulnerable to microbiological contamination. For most affected systems, the rule requires both filtration and disinfection to control this contamination.

Definitions and source classification

The federal rule defines **groundwater under the direct influence of surface water** as:

"any water beneath the surface of the ground with:

1. *significant occurrence of insects or other macroorganisms, algae or large-diameter pathogens such as* Giardia lamblia*, or*
2. *significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions".*

"Under the direct influence of surface water" means the groundwater source is located close enough to nearby surface water, such as a river or lake, to receive direct surface water recharge. Since a portion of the groundwater source's recharge is from surface water, the groundwater source is considered at risk of contamination from pathogens such as *Giardia lamblia* and viruses, which are not normally found in true groundwaters.

Sources most likely to be under the direct influence of surface water are:

- Infiltration galleries and Ranney wells located near surface waters.
- Poorly constructed springs.
- Shallow wells located near surface waters.

Process for designating sources as GWI

Records review. DOH conducts a records review to identify "potential" GWI sources. Potential GWI sources are defined as all infiltration galleries, Ranney wells, springs, and wells less than 50 feet deep located within 200 feet of surface water.

Determination of hydraulic connection. A water system may either conduct a hydrogeologic investigation or use the water quality monitoring (WQM) method to determine whether the potential GWI source is hydraulically connected to nearby surface water. The hydrogeologic investigation requires a licensed geologist; the water quality monitoring method does not.

The WQM method requires one year of weekly measurements of temperature and conductivity (or other parameters) at both the source and the surface water. The purveyor must arrange for statistical analysis of the data to determine if there is a correlation between source measurements and surface water measurements. The department can provide assistance and will check the validity of the analysis. If either the WQM method or a hydrogeologic investigation indicate a hydraulic connection, the source is designated as a groundwater in hydraulic connection with surface water, requiring disinfection and microscopic particulate analysis.

Microscopic particulate analysis. The water system collects a sample of source water and sends the sample to a laboratory for a microscopic particulate analysis. If certain numbers or types of surface water organisms are found in the groundwater samples, the source is designated to be under the direct influence of surface water. Such sources are classified as GWI and are subject to the Surface Water Treatment Rule

Treatment requirements for systems with GWI sources

Water systems with GWI sources must achieve at least 99.9% removal or inactivation of *Giardia lamblia* cysts and at least 99.99% removal or inactivation of viruses. To accomplish this, systems must do all of the following:

- Filter, unless certain source quality and site-specific conditions are met to avoid filtration.
- Disinfect.
- Be operated by qualified personnel.

Compliance options

Systems with GWI sources or sources identified by the department as being "potential" GWI sources have several compliance options to choose from, including:

- Modify the source to eliminate direct surface water influence.
- Develop an alternate DOH-approved source (for example, develop a protected groundwater source or purchase from a nearby approved public water system).
- Attempt to meet the source quality and site-specific criteria to remain unfiltered.
- Install filtration.

More information and assistance

Department of Health, Office of Drinking Water

- Donna Freier, GWI Program Coordinator, (360) 586-5179 – (360) 236-3086, Summer 2006
- Regional Office GWI Program contacts:
  Eastern Regional Office, Jeff Johnson (509) 456-2797
  Northwest Regional Office, Derek Pell (253) 395-6763
  Southwest Regional Office, Regina Grimm (360) 586-4679 – (360) 236-3035, Summer 2006
- Website: http://www.doh.wa.gov/ehp/dw/. Provides access to publications on *Cryptosporidium* and other contaminants, information on how to hire an engineer, and many other resources. Also includes links to other sites such as the federal Environmental Protection Agency (EPA) and the American Water Works Association (AWWA.)
- Toll-free number: 1-800-521-0323

US Environmental Protection Agency: Safe Drinking Water Hotline 1-800-426-4791